MULTIMEDIA APPLICATIONS I

Curriculum Content Frameworks

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MULTIMEDIA APPLICATIONS I

Grade Levels: 11, 12
Course Code: 492360

Prerequisite: Keyboarding
Word Processing I & II (or Computer Business Applications)
Desktop Publishing I

Course Description: Multimedia Applications I is a one-semester course giving students advanced experience in using multimedia to merge text, graphics, video, and sound. Applied principles are used to analyze and organize information, set up a design structure, and produce special visual expressions.

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Unit 1: Introduction to Multimedia
Hours: 5

Terminology: Animation; Censorship; Copyright; Derivative work rights; Development system; Digital video; Electronic slide show; Fair use; Firewire; Graphics; Interactive; Kiosk; Multimedia; Multimedia careers; Playback system; Red, Green, Blue (RGB); Resolution; Royalty-free; Shareware; Sound; Text; Trademark; Universal Serial Bus (USB); Video capture device

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
1.1 Define multimedia and describe the basic elements of multimedia	1.1.1 Identify the five basic elements of multimedia • text • digital images • sound • video • animation	Foundation	Listening Reading	Comprehends ideas and concepts related to multimedia [1.2.1] Identifies related details, facts, and specifications [1.3.16]
1.2 Identify uses of multimedia and its impact on society	1.2.1 Examine different classifications of multimedia (education, business, entertainment, etc.)	Foundation	Listening Speaking	Comprehends ideas and concepts related to multimedia [1.2.1] Communicates a thought, idea, or fact in spoken form [1.5.5]
1.3 Discuss career opportunities in multimedia	1.3.1 Research careers in multimedia	Personal Management	Career Awareness, Development, and Mobility	Develops skills to locate, evaluate, and interpret career information [3.1.4]
1.4 Describe methods and equipment needed to deliver multimedia	1.4.1 Access three different multimedia sources (Internet, slide show, book on CD, etc.) and identify elements of each 1.4.2 List basic equipment needed for presentations (projectors, smartboards, etc.)	Foundation	Listening Reading Speaking	Comprehends ideas and concepts related to multimedia [1.2.1] Receives and interprets verbal messages [1.2.8] Uses written resources to obtain factual information [1.3.23] Applies/Uses technical terms appropriate to audience [1.5.2]

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do				ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge		**Application**		**Skill Group**	**Skill**	**Description**
1.5	Describe the hardware components of a multimedia playback system	1.5.1	Identify the hardware components of a playback system (processor, storage, etc.)	Foundation	Listening	Comprehends ideas and concepts related to multimedia [1.2.1]
		1.5.2	Identify the basic characteristics of color displays (RGB, resolution, etc.)			Receives and interprets verbal messages [1.2.8]
					Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
1.6	Describe the additional components needed for a multimedia development system	1.6.1	Identify the hardware components for a development system: • digital camera • digital video camera • scanner • microphone • speakers • firewire • video capture device • USB	Foundation	Listening	Comprehends ideas and concepts related to multimedia [1.2.1]
					Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
1.7	Describe the types of software needed to develop and play back multimedia projects	1.7.1	Identify software used for creating/editing the elements of multimedia projects	Foundation	Listening	Comprehends ideas and concepts related to multimedia [1.2.1]
		1.7.2	Identify types of software needed to create multimedia			Receives and interprets verbal messages [1.2.8]
		1.7.3	Identify software needed for playback, i.e., media players		Reading	Applies technical words that pertain to multimedia [1.3.6]
					Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
1.8	Discuss the laws and guidelines that affect multimedia, i.e., copyright, trademark, etc.	1.8.1	Explain the basic concepts of the copyright law, fair use, public domain, shareware, privacy, trademark, derivative works, and royalty-free	Foundation	Listening	Comprehends ideas and concepts related to education and multimedia [1.2.1]
						Receives and interprets verbal messages [1.2.8]

Unit 2: Storage
Hours: 5

Terminology: Burner, Compact disk, Compact Disk-Read Only Memory (CD-ROM), Compact Disk-Recordable (CD-R), Compact Disk-Re-Writable (CD-RW), Digital Video Disk (DVD), Digital Video Disk-Read Only Memory (DVD-ROM), Digital Video Disk-Recordable (DVD-R+R), Digital Video Disk-Re-Writable (DVD-RW+RW), Dual layer, Flash drive, Flash memory, Gigabyte, Kilobyte, Magnetic storage, Megabyte, Memory card, Optical storage, Read speed, Rewrite speed, Write speed

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
2.1 List storage media and hardware available for multimedia	2.1.1 Compare and contrast storage media available and the storage capacity of each of the following: • CD-ROM • CD-R • CD-RW • DVD-ROM • DVD-R+R • DVD-RW+RW • flash drive (i.e., thumb, USB, jump) 2.1.2 Compare and contrast the advantages and disadvantages of available storage media/hardware 2.1.3 Access/Write using an optical storage media (CD/DVD)	Foundation	Listening Reading Speaking	Comprehends ideas and concepts related to storage media and hardware [1.2.1] Reads and follows instructions to operate technical equipment [1.3.19] Participates in conversation, discussion, and group presentations [1.5.8]

Unit 3: Digital Imaging
Hours: 20

Terminology: Bitmap (BMP), Clip art, Cloning, Cropping, Digital zoom, Draw program, File conversion, Graphics Interchange Format (GIF), Grayscale, Image size, Joint Photographer Experts Group (JPEG), Lossless compression, Lossy compression, Macro zoom, Object layering, Optical zoom, Paint program, Pixel, Portable Network Graphics (PNG), Raster, Scaling, Screen capture, Stock photographs, Tagged Image File Format (TIFF), Thumbnail, Vector graphic, Windows Metafile (WMF)

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
3.1 Discuss the basic characteristics of the digital camera	3.1.1 Demonstrate understanding of the basic characteristics of the digital camera • storage media • uploading images • changing resolution • special effects and settings • zoom 3.1.2 Demonstrate basic maintenance and care of the digital camera	Foundation	Reading Speaking Science	Identifies relevant details, facts, and specifications [1.3.16] Participates in conversation, discussion, group presentation [1.5.8] Applies knowledge to complete a practical task [1.4.3]
3.2 Discuss digital image file formats and compression	3.2.1 Identify the two categories of digital images • bitmap • vector 3.2.2 Identify digital file formats • .bmp • .gif • .jpg • .png • . tif • .wmf 3.2.3 Compare the file sizes and qualities of digital images 3.2.4 Convert an image to a different format	Foundation	Listening Reading Writing	Comprehends ideas and concepts related to graphic formats [1.2.1] Applies/Understands technical words that pertain to subject [1.5.2] Analyzes data, summarizes results, and makes conclusions [1.6.2] Applies/Uses technical words and concepts [1.6.4]

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do				ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge		**Application**		**Skill Group**	**Skill**	**Description**
3.3	Identify the software available for creating and editing digital images	3.3.1	Examine software for creating and editing bitmap (paint) and vector (draw) images	Thinking	Creative Thinking	Uses imagination to create something new [4.1.1] Combines ideas or information in a new way [4.1.2]
		3.3.2	Create and edit digital images in some of the following ways: • crop • resize proportionally (scaling) • combine images • convert to grayscale • add transparent overlay • masking • cloning		Knowing how to Learn	Applies new knowledge and skills to digital images [4.3.1]
3.4	Identify sources and specific uses of digital images	3.4.1	Locate sources of royalty-free stock photography and other digital images	Thinking	Creative Thinking	Uses imagination to create something new [4.1.1]
		3.4.2	Perform a screen capture			Combines ideas or information in a new way [4.1.2]
		3.4.3	Create a multimedia presentation incorporating digital images		Knowing how to Learn	Applies new knowledge and skills to graphic images [4.3.1] Locates appropriate learning resources [4.3.3]

Unit 4: Sound
Hours: 10

Terminology: Compact Disk Audio (CDA), Kilohertz (kHz), Media player, Microphone, MP3, Musical Instrument Digital Interface (MIDI), Plug-in, Real Audio (RA), Ripper, Sampling, Sampling rate, Sound card, Sound editor, Streaming audio, Volume, Wave (WAV), Windows Media Audio (WMA)

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
4.1 Discuss how sound is used in multimedia	4.1.1 Access multimedia sources that have sound	Foundation	Listening	Comprehends ideas and concepts related to multimedia sound [1.2.1]
	4.1.2 Analyze purpose of sound in multimedia		Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
	4.1.3 Judge whether sound enhances or detracts from the application	Thinking	Decision Making	Evaluates information/data to make the best decision [4.2.5]
4.2 Discuss common sound file formats and compression	4.2.1 Compare the quality and size of audio formats • midi • .mp3 • .ra • .wav • .cda • .wma	Foundation	Listening	Comprehends ideas and concepts related to waveforms [1.2.1]
4.3 Discuss the software/ hardware and settings needed for sound playback, creation, and editing	4.3.1 Connect speakers, microphone, and headphones to the computer and adjust settings	Foundation Thinking	Reading Science	Reads and follows instructions to operate technical equipment [1.3.19]
	4.3.2 Identify programs available for playback		Knowing how to Learn	Applies knowledge to complete a practical task [1.4.3]
	4.3.3 Create a sound file using recording software • set sampling rate			Uses equipment and techniques to record narration, edit sound files, and insert audio clips [1.4.23]
	4.3.4 Edit a sound file using a sound editor program • mix sound • insert sounds • cut sounds • rip sound files • convert sound formats			Uses available resources to acquire new skills or improve skills [4.3.4]

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do				ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge		**Application**		**Skill Group**	**Skill**	**Description**
4.4	Identify sources and specific uses of sound files	4.4.1	Locate Web sites for royalty-free sound files	Foundation	Listening	Comprehends ideas and concepts related to multimedia sound [1.2.1]
		4.4.2	Record a narration for a multimedia project		Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
		4.4.3	Insert audio clips into a multimedia project	Thinking	Decision Making	Evaluates information/data to make the best decision [4.2.5]

Unit 5: Introduction to Video
Hours: 10

Terminology: Analog, Audio Video Interleave (AVI), Digital, Media player, Motion Picture Experts Group (MPEG), MOV, Plug-in, Real-time, Streaming media, Video, Video camera, Windows Media Video (WMV)

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
5.1 Define video and describe ways that it can enhance multimedia	5.1.1 View examples of video in multimedia presentations	Foundation	Listening	Comprehends ideas and concepts related to digital video [1.2.1]
	5.1.2 Compare/Contrast analog and digital video		Speaking	Applies/Uses technical terms appropriate to audience [1.5.2]
5.2 Describe the most commonly used file formats for digital video	5.2.1 Compare/Contrast video file formats • .avi • .mpeg • .wmv • .mov	Foundation	Listening	Comprehends ideas and concepts related to digital video [1.2.1]
			Reading	Applies/Understands technical words that pertain to subject [1.3.6]
5.3 Describe sources for obtaining and viewing video	5.3.1 Locate and view examples of video • on the Internet • camcorder • DVD/CD • VHS	Foundation	Listening	Comprehends ideas and concepts related to digital video [1.2.1]
		Thinking	Knowing how to Learn	Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]
5.4 Identify the software available for creating videos	5.4.1 Create a video using images	Thinking	Creative Thinking	Uses imagination to create something new [4.1.1]
			Seeing Things in the Mind's Eye	Visualizes a finished product [4.6.4]

Unit 6: Integration
Hours: 10

Terminology: None

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do				ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge		**Application**		**Skill Group**	**Skill**	**Description**
6.1	Integrate the basic elements of multimedia into a project	6.1.1	Create a multimedia project with sound, digital images, and text	Thinking	Creative Thinking	Uses imagination to create something new [4.1.1]
					Seeing Things in the Mind's Eye	Visualizes a finished product [4.6.4]

Glossary
Unit 1: Introduction to Multimedia

1. Animation – a simulation of movement or the perception of motion created by the rapid display of a series of still images
2. Censorship – an issue related to who will regulate the contents of a CD title, especially concerning pornography, racism, and violence
3. Copyright – laws designed to protect intellectual property rights and provide potential monetary rewards for inventiveness and hard work
4. Derivative work rights – the right to alter content, take extracts from it, combine it with another work, translate it into another language, or otherwise create a new work from an existing piece of content
5. Development system – a high-end computer system used to create multimedia projects
6. Digital video – a full-motion recording that is converted into bitmaps using frame grabbers or similar devices attached to a computer
7. Electronic slide show – a computer-based multimedia presentation that displays information in a slide format for presentation on a computer monitor, television screen, or through a projector to a screen
8. Fair use – a section of the U.S. Copyright Law that allows the use of copyrighted works in reporting news, conducting research, and teaching
9. Firewire – high-speed serial technology for connecting peripherals to a computer; particularly popular for multimedia peripherals, such as digital video camcorders and other high-speed devices like hard disk drives and printers
10. Graphics – multimedia elements such as drawings, photos, or pieces of clip art
11. Interactive – a feature of a multimedia project that allows the user to control some aspects of the presentation
12. Kiosk – a free-standing, computer-based system that allows transactions, such as airline self-ticketing systems, or provides information, such as those systems found in shopping malls
13. Multimedia – a computer-based communications process that incorporates text, graphics, sound, animation, and video
14. Multimedia careers – careers that incorporate multiple elements of multimedia, such as game design, music and video production, animation, Web design, etc.
15. Playback system – a computer that is configured to play multimedia projects, as contrasted with a development system used to create multimedia projects
16. Red, Green, Blue (RGB) – the color model used to display color on computer monitors, televisions, and similar devices
17. Resolution – the quality or sharpness of an image, usually measured in pixels per inch; the more pixels, the higher the resolution
18. Royalty-free – prepared material that can be used legally without paying a fee to the artist, publishing company, etc.
19. Shareware – software distributed on the basis of an honor system

20. Sound – a multimedia element such as a narration, music, or other sound clip

21. Text – a multimedia element consisting of alphanumeric characters

22. Trademark – a name, symbol, or other device identifying a product; it is officially registered with the U.S. government and its use is legally restricted to its owner

23. Universal Serial Bus (USB) – an external bus standard that supports data transfer rates of 480 mbps (480 million bits per second)

24. Video capture device – an expansion device (internal or external) that digitizes full-motion video from a VCR, camera, or other video source; may also provide digital to analog conversion for recording onto a VCR

Unit 2: Storage

1. Burner – a CD or DVD writer; can be internal or external

2. Compact Disk (CD) – an optical storage medium made of molded polymer for electronically recording, storing, and playing back audio, video, text, and other information in digital form

3. Compact Disk-Read Only Memory (CD-ROM) – a CD that contains data a computer can read but to which the computer cannot write new data

4. Compact Disk-Recordable (CD-R) – a CD on which a computer can write data that cannot be overwritten

5. Compact Disk-Re-Writable (CD-RW) – a CD on which a computer can store, erase, and replace data

6. Digital Video Disk (DVD) – a CD-like optical disk with a capacity of 4.7 gb or more that can hold a full-length commercial movie

7. Digital Video Disk-Read Only Memory (DVD-ROM) – contains data that a computer can read but to which the computer cannot write new data

8. Digital Video Disk-Recordable (DVD-R+R) – data written to a DVD-R+R disk that cannot be overwritten

9. Digital Video Disk-Re-Writable (DVD-RW+RW) – data written to a DVD-RW+RW can store, erase, and replace data

10. Dual layer – a two-layer DVD that can hold almost twice as much storage as a single-layer disk

11. Flash drive – a plug-and-play portable storage device that uses flash memory and is lightweight enough to attach to a key chain; also known as a pen drive, keychain drive, thumb drive, jump drive

12. Flash memory – sometimes called “flash RAM”, a type of constantly powered nonvolatile memory that can be erased and reprogrammed

13. Gigabyte – a unit of storage measuring roughly 1,000,000,000 bytes (gb)

14. Kilobyte – a unit of storage measuring roughly 1,000 bytes (kb)

15. Magnetic storage – storage device that encodes data as microscopic magnetized needles on the disk's surface

16. Megabyte – a unit of storage measuring roughly 1,000,000 bytes (mb)

17. Memory card – a small, removable storage device used to store data in digital input devices such as cameras and audio recorders; some versions are called *memory sticks*

18. Optical storage – storage device that records data by burning microscopic holes in the surface of the disk with a laser; to read the disk, another laser beam shines on the disk and detects the holes by changes in the reflection pattern

19. Read speed – the speed at which data is read from a CD or DVD

20. Rewrite speed – the speed at which data can be rewritten to a CD-RW or DVD-RW

21. Write speed – the speed at which data is written to a CD-R or DVD-R

Unit 3: Digital Imaging

1. Bitmap (BMP) – a graphic that represents the digital image as an array of dots called pixels; uncompressed bitmap file format that supports only 256 colors; format is very large and is not appropriate for the Web

2. Clip art – ready-to-use illustrations

3. Cloning – making an exact duplicate of digital image data or copying part of an image onto another

4. Cropping – eliminating unwanted areas of an image

5. Digital zoom – takes a portion of the image and enlarges it electronically; the image quality is reduced since digital zoom enlarges the same set of pixels without adding detail

6. Draw program – program used to create draw-type graphics (vector graphics); provides for freehand as well as geometric shapes

7. File conversion – the process of saving a file in a different file format than its current format; i.e., converting .jpg to a .tif

8. Graphics Interchange Format (GIF) – compressed bitmap file format (lossless) that supports only 256 colors; supports transparency and animation; appropriate for the Web

9. Grayscale – the use of many shades of gray to represent an image

10. Image size – the display size of an image represented in pixels; an image size of 640 x 480 would be 640 pixels wide and 480 pixels high

11. Joint Photographer Experts Group (JPEG) – compressed bitmap file format (lossy) preferred for photographs; supports 16 million colors and is appropriate for the Web; does not support transparency or animation

12. Lossless compression – a formula that reduces the file size without data loss

13. Lossy compression – a formula that reduces the size of a file by removing certain pixels

14. Macro zoom – allows you to take extreme close-ups

15. Object layering – a feature that allows you to place one image on top of another and edit each independently

16. Optical zoom – physically increases the length of the lens, essentially creating a magnifying glass; produces a higher-quality image

17. Paint program – a program used to create bitmap images; useful in creating original art because it provides the tools used by artists (such as brushes and pens)

18. Pixel – a single point in a graphic image on a digital display; the smallest unit a monitor can display

19. Portable Network Graphics (PNG) – compressed bitmap file format (lossless) similar to the GIF format but is not limited to 256 colors; appropriate for the Web; supports transparency

20. Raster – another term for *bitmap*

21. Scaling – a change in the size of an image or element in both X-Y directions

22. Screen capture – copying whatever is displayed on the screen as a graphic

23. Stock photographs – ready-to-use photographs

24. Tagged Image File Format (TIFF) – uncompressed bitmap file format; supports 16 million colors; file size is very large and is not appropriate for the Web

25. Thumbnail – a small image that is linked to a large image

26. Vector graphic – also called *draw-* type graphic, an image created by using a series of mathematically defined lines and curves rather than pixels, making the image easier to rescale

27. Windows Metafile (WMF) – vector file format; most Microsoft clip art images are Metafiles and can be edited

Unit 4: Sound

1. Compact Disk Audio (CDA) – the file extension for song files on music CDs

2. Kilohertz (kHz) – unit of measurement for sampling sound waves; literally, 1,000 cycles per second; in the case of audio, 1,000 samples per second

3. Media player – a program that allows you to play audio, video, and mixed-media files

4. Microphone – an input device used to record messages, audio, or commands

5. MP3 – a compressed audio file format that is the current standard for exchanging music files over the Internet; MP3 gets its name from MPEG, audio layer 3

6. Musical Instrument Digital Interface (MIDI) – pronounced *middy*; an audio file format for recording music from synthesizers and other electronic instruments

7. Plug-in – a program that permits a Web browser to access and execute files that the browser would not normally recognize

8. Real Audio (RA) – a file format developed by Real Networks specifically for streaming over the Internet; when sounds are saved in this format, they are automatically compressed to reduce the file size

9. Ripper – a software program that "grabs" digital audio from a compact disk and transfers it to a computer's hard drive

10. Sampling – reproducing a sound by recording many fragments of the sound

11. Sampling rate – the number of times per second a recording device samples sound waves; the rate is measured in kilohertz

12. Sound card – an expansion board that enables a computer to manipulate and output sounds

13. Sound editor – software used to edit wave files

14. Streaming audio – audio that is transmitted over the Internet and played in real time

15. Volume – the height of each peak of a sound wave, which determines loudness

16. Wave (WAV) – standard audio format for Windows applications; file format is only slightly compressed

17. Windows Media Audio (WMA) – audio file format that can be played by Windows Media Player; files copied from a music CD to Windows Media Player will be converted to a WMA file format

Unit 5: Introduction to Video

1. Analog – the representation of information in a continuous stream rather than as individual pieces of data (digital) – i.e., television signals are typically analog; by contrast, computer signals are digital

2. Audio Video Interleave (AVI) – the filename extension for Microsoft Windows standard video format

3. Digital – the representation of information as individual pieces of data using the numbers 1 and 0, rather than as a continuous stream (analog)

4. Media player – a program that allows you to play audio, video, and mixed-media files

5. MOV – file extension for a QuickTime movie

6. Motion Picture Experts Group (MPEG) – a file format that provides frame-to-frame compression

7. Plug-in – a small software program that plugs into a larger application to provide more capabilities

8. Real-time – refers to data, such as video or sound, broadcast or transmitted without editing or delays

9. Streaming media – a technique that allows viewing or listening to media before it has completely loaded and without placing as many demands on computer resources

10. Video – a series of framed images put together, one after another, to simulate motion and interactivity

11. Video camera – a camera that takes continuous pictures and generates a signal for display or recording; captures images by breaking down the image into a series of lines

12. Windows Media Video (WMV) – video file format that can be viewed in Windows Media Player

Unit 6: Integration

No terminology for this unit